Invite your representative to work. Change the world. Here's how.

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ABSTRACT **Today's political climate can seem hostile to science. Alternative facts, climate change denial, and relabeling of actual news as fake news are discouraging phenomena for sure. But these trends make it more important than ever to engage our politicians. Take heart! There is something you can do. You can show your representatives firsthand the amazing things you do, evidence of the economic engine that your activities generate, and the real people behind the discoveries. I did, and it was fun. We invited our congressman to the University of California, Santa Barbara (UCSB), and he accepted! For 2 hours, we explained and demonstrated efforts to cure blindness using stem cells, the medical implications of the discovery that cells can recover from the brink of death, a mosquito lab striving to eliminate insect-borne disease, and an Alzheimer's disease laboratory. Salud Carbajal peered through a microscope and met real scientists. Before his visit, he did not know what a postdoctoral fellow was, much less what stem cells look like. When he left he knew our names, how much money we bring into his district, and how important National Institutes of Health funding and international mobility are to our enterprise. Although I live in the United States, this approach should also apply to other democratic countries. If each of us converts one representative into a science champion, we can change the world.**

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HOW DO I GO ABOUT INVITING MY REPRESENTATIVES?

One day, I received an email from ASCB encouraging me to invite my congressional representative to work. Ordinarily, I would have immediately clicked "delete." Though I would have thought that it sounded like a good idea, I would have had no clue how to go about it. However, on this day, a new synaptic connection flickered, and I recognized instead that I had recently met someone who might be able to help. I was serving on a search committee, composed of people from across our campus, for a new vice chancellor for research. Each time we introduced ourselves, I heard that Monica was from the Office of Government Relations, though I had no inkling what that office did. Suddenly it occurred to me what they might do. So, instead of "delete," I clicked "forward" and asked Monica whether this was something her office could help us arrange. Her immediate reply was "Absolutely, that's exactly the type of outreach our office organizes! … This is a great idea, and I appreciate you reaching out!" Very soon, we were planning the itinerary. So if you would like to invite your representative to work, contact your Office of Government Relations, which might be called something slightly different such as the Congressional Liaison Office. It turns out all universities have them. Who knew?

WHAT SHOULD THE ITINERARY LOOK LIKE?

Our goal was to engage and educate our congressman. Two postdocs from my husband's lab had recently attended a town hall meeting. When they introduced themselves to our newly elected representative, Salud Carbajal, they discovered that he did not know what a postdoctoral fellow was. Having graduated from UCSB, he was certainly familiar with the university, but he was unfamiliar with the science side of campus. We had the luxury of 2 hours with our representative. So we crafted a mixture of PowerPoint presentations

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Abbreviations used: mAb, monoclonal antibody; NIH, National Institutes of Health; UCSB, University of California, Santa Barbara.

FIGURE 1: Clockwise from top left: Congressman Salud Carbajal, postdoctoral fellow Varuzhan Balasanyan, technician Adishti Gurav, PhD student Junjie Luo, PhD student Nick DeBeaubien, Congressman Carbajal, Congressman Carbajal, technician Cassidy Arnold, postodoctoral fellow Brittney Pennington, Congressman Carbajal. PhD student Nick DeBeaubien, Congressman Carbajal, Professor Craig Montell, Congressman Carbajal, Center photo: Congressman Carbajal with Professor Denise Montell.

and lab demonstrations. We introduced him to graduate students, postdocs, faculty, and administrators. We kept him moving, so as not to bore him, and stuck to a strict schedule. Representatives are busy. Everyone wants a piece of them.

Our itinerary started with an overview of research at UCSB, presented by our vice chancellor for research (the same one Monica and I had helped hire into the position). His name is Joseph Incandela, and he was one of the major leaders of the international team of particle physicists who discovered the Higgs boson or God particle. That is about as famous as scientists get, so our congressman had heard of him and his team's discovery. Next, our dean of mathematical, life, and physical sciences spoke. He is also a physicist, and he frequently says that if he were starting out today, he would go into the life sciences. So that was a nice transition into the rest of our program. Our next presentation was from a charismatic graduate student who had recently won our Grad Slam competition. This is a contest among students from across the university for the best 3-minute presentation of their research. Students compete through multiple rounds, and our own Leah Foltz had won the grand prize (which includes $5000 cash!). This event started at UCSB in 2013 and became so popular that it has spread to all 10 UC campuses. Now the winners from each campus compete in a UC-wide event, and Leah had just won the People's Choice Award there. So we were excited to include her 3-minute presentation in the congressman's itinerary. He was engaged, duly impressed, and asked questions. Next, we wanted to get him into the lab, so we organized a tour and hands-on activity in the stem cell laboratory (Figure 1). Congressman Carbajal first learned about how stem cells are made and their great potential for curing diseases, including macular degeneration. Then he went into the lab, put on a lab coat and gloves, and got to peer into the microscope to see what these powerful cells look like (Figure 1).

His next stop was my office, where I told him of our discovery that cells can recover from the brink of apoptotic cell death. I showed him a movie of cells shriveling up and coming back to life. I told him how dependent we are on the National Institutes of Health (NIH) and shared with him the burning questions that make us jump out of bed every morning. Will enhancing cellular recovery from the brink of death be useful in limiting the damage due to heart attacks and strokes? Would selective inhibition of this recovery improve cancer treatment and prevent relapse? If we don't stay funded, we will never know. We let him chew on that thought while we walked to the cell culture room and our live-imaging microscope. Along the way, he met postdocs from Armenia, China, and India, a technician from Ethiopia, and trainees from places closer to home like Irvine, San Diego, and, of course, Santa Barbara. He saw with his own eyes how important international mobility is for the U.S. research enterprise.

Salud's next stop was Craig Montell's lab, where he heard about their new efforts to apply the insights they have gleaned from studying fruit fly behavior for 30 years to alter mosquito behavior in order to limit insect-borne diseases. This work makes the important point that basic research in model organisms can be used in many different ways to combat human diseases. Craig Montell did not imagine 30 or 20 or 10 years ago that his lab's work on *Drosophila* might have an impact on zika or dengue. The congressman then took a tour of the mosquito lab and met more students and postdocs (Figure 1).

Congressman Carbajal's final stop of the day was in Ken Kosik's Altzheimer's disease laboratory. Ken has been on *60 Minutes* (www.mcdb.ucsb.edu/news/2016/alzheimers-laboratory), because he initiated a collaboration with a doctor in Colombia who had been treating a family that has a devastating incidence of early-onset Alzheimer's disease. This collaboration resulted in the identification of a mutation in the gene coding for Tau, which predicts with virtually 100% certainty which family members will get this debilitating disease. Potential treatments for Alzheimer's are being tested in this family, because the Kosik team knows exactly who will get the disease and who does not carry the mutated allele. This makes the clinical trials more powerful than anything that can be carried out with the general population, in which the risks are much lower.

WHAT ARE THE SECRETS TO SUCCESS?

You already know the first secret. Knowing the office to contact to set it up is the first essential piece. Second, a good mix of renowned senior scientists and charismatic and diverse junior scientists keeps it interesting. A mix of lecture and active learning will also keep your visitors engaged and interested. The schedule was tight, and there was not quite enough time for all of his questions, but I think it was not so bad to leave him wanting to know more. We did not waste time traveling. He moved up or down one or two flights of stairs, getting to see a number of different offices and labs and a nice change of scenery, without sacrificing time. We offered water, coffee, and cookies at every stop, where allowed by safety, but nothing extravagant.

WHAT ARE THE CHALLENGES?

Organizing this event was pretty straightforward. Everyone who was invited to participate did so eagerly and made time in their schedules. One challenge you might encounter is that many other people might hear about your event and want to participate. It is important to maintain control of the agenda. I did not have a big problem with this; however, there was one request for us to showcase research on campus funded by the Department of Defense (DoD), in part because Congressman Carbajal is a member of the Armed Services Committee. On one hand, it is important to recognize the congressman's interests and where he wields power. On the other hand, DoD is under no threat of reduced funding, and because I had initiated the visit, I wanted to focus on NIH-funded research, which was threatened. Our vice chancellor did mention the large DoD-funded research enterprise at UCSB in his overview. But I quietly insisted that we keep the agenda focused on life science. I suggested that the Office of Government Relations invite the congressman back for another visit, and possibly many other visits, to highlight different parts of the campus.

A second challenge is that congressional representatives run for election every 2 years. Therefore, they are very interested in activities that are likely to yield fruit in that time frame. You will probably get questions about when your research project is likely to generate a cure. We have to emphasize that research is a long-term investment. Today's new medicines were someone's bright idea 10 or 20 years ago. Give specific examples. For me, this is easy. I am alive today because of a monoclonal antibody (mAb) called Rituxan. mAb therapy was touted as a "magic bullet against cancer" in the late 1970s and early 1980s. However, it took 20 years for the first mAb therapy to achieve clinical utility. That is because there were unanticipated hurdles. It took decades to identify the problems and develop the technologies to address them. Today, there are dozens of mAbs approved for clinical use. If we do not keep investing in fundamental knowledge, the pipeline will dry up, and there will be no new medicines 5 or 10 or 20 years from now. This is a key but challenging point to make.

A related challenge is neither over- nor underselling our achievements and the promise of our ongoing studies. Most scientists understandably tend to be conservative in this regard. We want to maintain our credibility and be sure not to overpromise and then fail to deliver. However, if we are too conservative, we don't make a compelling case. So we have to walk that tightrope. Be prepared to answer the question about when your studies will produce actual treatments. Give a best-case scenario but be honest that there may be unanticipated challenges and setbacks that cause delays. Answer that the nature of research is that we cannot know in advance. Repeat that today's cures were someone's bright idea 10 or 20 years ago and that we have to continually invest or the pipeline will dry up.

WHAT ARE THE REWARDS?

This experience was extremely rewarding, and I thank Kevin Wilson, the ASCB public policy advocate for suggesting it! The feedback we received from Congressman Carbajal's office was very positive. Monica wrote, "I would like to thank you all for making the time to meet with Congressman Carbajal this afternoon. Everything went very smoothly, and he went out of his way to express how impressed he was with everything he heard and saw. I think we got across the message of the importance of federal funding in the biomedical sciences very well. I want to especially thank Denise for all the work she put into the agenda and logistics."

The most important reward is that we educated our representative about what we do and potentially converted someone who would have been reasonably supportive of federal funding for research into a champion of our cause. If your representatives are not already fans of the NIH, perhaps such a visit will sway them. If, like Carbajal, they are starting out with a positive view, perhaps the visit will convert them into true advocates, not only voting the right way but also persuading others to do so. At a minimum, we will have more informed representatives. Additionally, my institution actually thanked me! Furthermore, this event motivated the vice chancellor for research to learn more about the life sciences on campus. As a prominent particle physicist, he is an extremely intelligent and curious man. I am delighted that he returned a few months later and spent several hours learning about a variety of projects going on in our department. I even received an email just the other day in which he said he had come across a popular science article that made him think of our work.

Finally, the visit made all of us—students, postdocs, faculty, and administrators—feel just a little bit more empowered. We live in a democracy. Our representatives need to hear from us. It is our duty as citizens. And if each of us converts one representative into a science champion, we can change the world for the better.